DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333 - 0001

REPLY TO
ATTENTION OF

AMCSF-X (385-64a) 21 December 1992

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Safe Use of Power Nailers in Ammunition Operations

1. References:

a. Message, HQ AMC, AMCSF, 131245Z OCT 92, subject: Pneumatic and Explosive Nail Guns in Ammunition Operations.

b. Memorandum, U.S. Army Defense Ammunition Center and School, SMCAC-ESP, 10 Dec 92, with 1st End, HQ AMCCOM, AMSMC-SF, 10 Dec 92, subject as above (enclosed).

2. Reference 1a temporarily prohibited the use of power nailers within 50 feet of explosives pending the development of safe use criteria by the U.S. Army Defense Ammunition Center and School (USADACS). Those criteria are stated in reference 1b. Pneumatic nailers may be used in ammunition operations within the constraints stipulated in enclosure 1 to reference 1b. Also note that motor vehicle and rail car loading, blocking and bracing operations must be planned and executed in a manner that affords personnel a clear path of egress. Assistance in planning less-than-truck-load, less-than-car-load, and other load arrangements may be requested from the Director, U.S. Army Defense Ammunition Center and School, ATTN: SMCAC-DET, Savanna, IL 61074-9639, DSN 585-8071.

3. Publication of a revised AR 385-64, Ammunition and Explosives Safety Standards is expected in the immediate future, which will require implementation of a new DA pamphlet that addresses many safety requirements currently in AMC-R 385-100. We plan a significant revision of AMC-R 385-100 at that time to delete duplication. To the extent that it may not be covered in the new AR and pamphlet, we will incorporate the enclosed policy on pneumatic nailers in AMC-R 385-100. In advance of formal staffing of AMC-R 385-100, your comments regarding the policy are welcome.

4. Point of contact is Mr. Eric Olson, DSN 284-9475.

5. AMC--America's Arsenal for the Brave

THE COMMANDER:

JOHN E. RANKIN
Chief
Safety Office

DISTRIBUTION
See page 2

DEPARTMENT OF THE ARMY
US ARMY DEFENSE AMMUNITION CENTER AND SCHOOL
SAVANNA, ILLINOIS 61074-9639

REPLY TO
ATTENTION OF:

SMCAC-ESP (385[A])

DEC 992

MEMORANDUM THRU Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-SF, Rock Island, IL 61299-6000

FOR Commander, U.S. Army Materiel Command, ATTN: AMCSF, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

SUBJECT: Safe Use of Power Nailers in Ammunition Operations

1. Reference 1st endorsement, U.S. Army Armament, Munitions and Chemical Command (AMCCOM), AMSMC-SFP, 27 October 1992, to memorandum, U.S. Army Materiel Command (AMC), AMCSF, 13 October 1992, subject: Accident Investigation, Lexington-Blue Grass Army Depot (LBAD).

2. Power nailers may be safely employed in any operation involving any ammunition or explosives provided the provisions described at enclosure 1 are implemented to substantially reduce the probability of inadvertently driving a nail into the explosive material.

3. The risk presented by a hazard may be controlled through two methods. Reduction of either the hazard probability or the hazard severity effectively reduces the risk. Both means of risk reduction were examined with respect to the use of power nailers in ammunition operations. In this study, the hazard was taken as being the inadvertent driving of a nail into an ammunition item using a power nailer.

a. Nails driven by power nailers may exit the nailer at speeds of 132 feet per second, possessing significantly more energy than a manually driven nail. This gives a nail from a power nailer very great penetration capability, with enough force to initiate sensitive explosives. The hazard severity could be reduced if power nailers were restricted to operations with munitions which could not be initiated in this fashion due to the munition design, packaging, or characteristics of the energetic material. Although recent accidents with power nailers involved flares, pyrotechnic devices are not the only types of ammunition which could be initiated if impacted by a nail with sufficient force. Percussion primed ammunition, such as 105mm semi-fixed howitzer ammunition or 40mm HEDP, would be initiated if the primer was struck. Propelling charges, mortar ammunition, bulk propellant, bulk explosives, and combustible cartridge case ammunition are examples of types of ammunition and explosives which might be initiated if struck by a nail from a power nailer, but this list is not all inclusive. Controlling the risk presented by power nailers by limiting their use to specific types of ammunition to assure non-catastrophic consequences in the event of an accident, would require a continual program of testing in order to address all ammunition in all packing configurations.

b. This risk can also be controlled by reducing the probability of accidentally driving a nail into an ammunition package. Power nailers can be obtained with safeties which eliminate the most likely cause of accidentally driving a nail, which is bumping the nose safety while the trigger is depressed. Eliminating the most likely cause of accidentally driving a nail into an ammunition package effectively makes an explosives accident caused by a power nailer a non-credible event.

c. The hazard presented by the use of power nailers in ammunition operations can be adequately controlled without regard to the specific ammunition or explosives involved. Therefore, it is not necessary to identify criteria for the selection of specific ammunition items with which power nailers may be safely employed.

4. As previously stated, power nailers may be safely employed in any operation involving ammunition or explosives provided the provisions described at enclosure 1 are implemented. These provisions must be incorporated into SOPs along with installation-specific information. The application of these provisions does not relieve installations from the responsibility to perform hazards analyses of specific operations involving power nailers.

5. In the accident which occurred at LBAD, the operator was in a position from which he did not have clear egress from the trailer. Clear egress can be maintained by progressively blocking and bracing as the conveyance is loaded or, in the case of less than truckload (LTL) shipments, by choosing an arrangement for the load which does not require the operator to work in an obstructed area. The U.S. Army Defense Ammunition Center and School (USADACS) has requested information on an existing computer program to assist installations in arranging LTL loads consistent with approved outloading procedures. Once the requested material is received, program applicability will be investigated. In the interim, assistance in LTL or other load arrangements can be obtained from the Transportation Engineering Division of USADACS. Regardless of LTL or full load, to assure a clear exit path for the operator, the blocking and bracing must be installed as the loading progresses.

6. Clear egress:

a. Maintenance of clear egress for operators during ammunition operations is a mandatory requirement of AMCR 385-100, 1 August 1985, Safety Manual, for operating lines and is a necessary work practice for any operation involving hazardous materials. It is recommended that AMCR 385-100 be revised to explicitly require clear egress be maintained for all ammunition/explosives operations. A DA Form 2028, 1 February 1974, Recommended Changes to Publications and Blank Forms, to accomplish this is at enclosure 2.

SMCAC-ESP (385[A])
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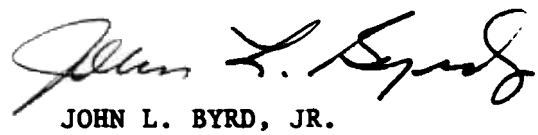
b. A cautionary note will be added to outloading drawings prepared by USADACS restating the need to maintain clear egress for operators. The text proposed for this note is at enclosure 3. This will also be publicized in the U.S. Army Technical Center for Explosives Safety (USATCES) Explosives Safety Bulletin as a follow-on to the recently published article on the LBAD accident. Other means of disseminating this information will also be pursued to assure it reaches all involved personnel.

7. Maintaining an environment conducive to safe ammunition operations is a responsibility of management. To accomplish this, management must be aware of all operations being conducted and exercise their responsibility to approve the methods of accomplishing these operations. Management must continually demonstrate that safe accomplishment of mission requirements is the highest priority.

8. The POCs are Messrs. Steven Blunk, SMCAC-ESP, DSN 585-8766, and William Frerichs, SMCAC-DET, DSN 585-8071.



3 Encls
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JOHN L. BYRD, JR.
Director
Defense Ammunition Center and School

CF (w/encls):
Office of the Chief of Staff, U.S. Army, ATTN: DACS-SF, Washington, DC 20310-0200
Commander, U.S. Army Depot System Command, ATTN: AMSDS-IN-S, Chambersburg, PA 17201-4170
Commander, U.S. Army Safety Center, ATTN: CSSC-Z, Fort Rucker, AL 36362-5363

Safe Use of Power Nailers Around Ammunition
Explosives Safety Concerns

1. Positive Controls. Power nailers used in ammunition operations must be equipped with dual safeties. They must incorporate a sequential safety device which prevents rapid fire operation (requires that the trigger be released and depressed for each nail driven) and one which requires that the nailer be flush against the work piece before a nail can be driven, or other mechanism which effectively prevents accidental discharge of a nail.

2 Safe Work Practices.

a. Whenever possible, power nailers should not be used in the vicinity of ammunition or explosives. All dunnage assemblies which can be fabricated without the presence of ammunition or explosives should be fabricated well away from the ammunition. Power nailers should not be used to construct or repairwooden components of ammunition unit loads; e.g. boxes, pallets, crates, etc., except for fabrication of components away from the ammunition. Nailed-in-place dunnage should be avoided whenever possible.

b. Before using a power nailer in an ammunition operation, a test should be conducted to determine the minimum air pressure which will reliably drive the nails. During use, the air pressure must be regulated to this value to avoid excess penetration.

c. Power nailers must always be held firmly and flush against the work piece when driving a nail.

d. When power nailers will be used to secure floor dunnage the nails must always be driven vertically into the floor.

e. As with all other ammunition operations, the operator of a power nailer must be provided clear egress at all times.

3. Fixed operations. Production line operations, or similar type operations, involving the use of automated nailing equipment must incorporate features to:

a. Assure proper alignment before driving nails, so that nails will not be driven into ammunition or explosives.

b Use the minimum force required to reliably drive the nails

c Shield personnel if hazards analysis demonstrates the necessity

d. Prevent operation in the event of a misaligned box or other malfunction of the system.

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4 Training.

a. In addition to the formal training required by AMCR 350-4, Training and Certification of Personnel in Ammunition Operations, job specific training must be provided before operators are allowed to use power nailers in ammunition operations. This training should include all of the explosives safety provisions above.

b. Note that 49 CFR part 172 requires that hazmat employees receive general awareness training, function-specific training, and safety training applicableto their job and must be retrained on a 2-year cycle. This requirement applies to operators who load, unload or prepare for transportation ammunition and explosives, among others. Thus, accomplishment of the training required to assure safe use of power nailers to prepare ammunition shipments is also required by federal law. Courses at USADACS are being prepared to supplement local training.

AMSMC-SFP (SMCAC-ESP/10 Dec 92) (310-1q) 1st End
SUBJECT: Safe Use of Power Nailers in Ammunition Operations

Commander, U.S. Army Armament, Munitions and Chemical Command, Rock Island, IL 61299-6000 10 December 1992

FOR Commander, U.S. Army Materiel Command, ATTN: AMCSF, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

1. This Command concurs with the basic comments of the U.S. Army Technical Center for Explosives Safety (USATCES) regarding the safety of use of power nailers in ammunition operations. Amplification or modification of some points is considered appropriate, however.

2. The interpretation of Federal law provided in paragraph 4b of enclosure 1, which states, "accomplishment of the training required to assure safe use of power nailers to prepare ammunition shipments is also required by federal law", is considered to be an excessively broad interpretation of the law. Training in the safe use of power nailers is a basic requirement, not limited to shipments of ammunition, but to any use. The law, of course, addresses all hazardous materials, not exclusively ammunition.

3. In responding to the original taskings, USATCES was obliged to address the issue of egress, and has done so in a competent manner. It is suggested, however, that with the publication of the Army regulation on explosives safety and the companion pamphlet, that this proposed change to AMCR 385-100, 1 August 1985, Safety Manual, with Change 1, 16 March 1990, paragraph be held in abeyance until the revised version of AMCR 385-100 is published. At that time, the requirement should be generalized to address the need for easy egress from any environment containing any hazardous material, not just from operating buildings or trucks and railcars.

4. As an added enclosure, rules for use of pneumatic nailers (the most common variety) are provided (encl 4). These rules go beyond the immediate concern of explosives safety and cover all accident and injury potentials. The rules have been prepared in a format suitable for reproduction and distribution to employees.

5. The POC is Mr. Glenn Leach, AMSMC-SF, DSN 793-2989.

Glenn S. Leach

GLENN S. LEACH
Acting Chief, Safety Office

4 Encls
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Added 1 encl
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